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The purpose for this brief is to highlight the challenge and potential of using virtual tools and settings to help out-of-school time (OST) programs achieve their goals. It draws on evidence-based guidance from education experts and practice-based advice from teachers and out-of-school time practitioners. The brief isn't intended to be comprehensive. Its primary audience is program leaders in Nita M. Lowey 21st Century Community Centers Grant Programs (21st CCLC programs). These programs provide academic enrichment to students who attend high-poverty and low-performing schools, and offer educational services to students' families.

Why "the Virtual Edge" Matters in Out-of-School Time Programs

At first glance, virtual learning and engagement may seem like a low priority for OST programs. After all, providing a safe, supervised physical space for students after school is often cited as a fundamental purpose and key benefit for such programs, along with providing access to academic support and enrichment experiences, nutrition, physical activities, and other services that support student well-being and success in school and beyond (youth.gov, 2021).

There are a number of reasons, however, to incorporate virtual tools and settings in OST programs. Here are some examples:

- To accommodate diverse learning needs and preferences.
- To connect students to experts and opportunities that aren't available locally.
- To help students gain digital skills and digital literacy needed for postsecondary education and work.
- To provide program services if power outages, bad weather or other emergencies make it dangerous or impossible to meet in person.
- To expand learning and engagement options for students, program staff, families, partners and other stakeholders.

OST professionals who gain "the virtual edge" are equipped to make good decisions about when and how to use technology for learning and engagement. They can use virtual tools ad strategies to achieve program goals, to increase family engagement and to expand professional development opportunities for staff. They can model and teach technology skills that will keep their students safe online and prepare them for success in the workplace. What follows is a big-picture look at how virtual learning has evolved (and continues to evolve) and considerations for OST programs seeking to incorporate various technologies thoughtfully and appropriately as the virtual landscape continues to evolve across all sectors of society.

The Evolution of Virtual Learning in K-12 Education

What we call "virtual learning" today evolved from "distance education" approaches that first delivered learning through print-based correspondence courses, then through media such as radio, television and videoconferencing. In remote, rural areas of Canada, New Zealand, Australia and the state of Alaska, many students continue to learn in these ways (Barbour, 2014).

Higher education and businesses were the first to adopt computer-based distance learning on a large scale. The first K-12 online private school in the U.S. opened in 1991, followed in 1994 by some full-time online public schools. In 1996-97, "virtual schools" got a boost from state and

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federal initiatives. In the 2000-01 school year, estimates showed 40,000 to 50,000 K-12 students enrolled in at least one distance education course. Within 10 years, that number had grown to more than 2 million students, and all 50 states offered some K-12 online and/or blended learning (Barbour, 2014). In the 2016-17 school year, nearly 3.4 million (6.3%) students in public K-12 schools were taking one or more online courses, the majority of which were accessed through their local public school (55%), state (12%) or charter school (16%) (U.S. Department of Education, 2020).

A 2019 report from the National Education Policy Center looked at the 2017-18 school year and found that 501 full-time virtual schools enrolled nearly 300,000 students, and 300 blended schools enrolled about 133,00 students. These schools were operated by a combination of public and private, nonprofit and for-profit education management organizations (Molnar et al., 2019). Although blended learning is often considered a strategy for integrating technology into the classroom, it's equally a strategy for supplementing learning outside the classroom. A blended school may offer online courses, such as a foreign language, that aren't available at the school or use online resources to provide remedial support, credit recovery, and advanced or dual-credit courses. Teachers may ask students to engage with recorded lectures or videos outside class time so that class time can be used for interactions and discussions about the topics being studied (Barbour, 2014). Unlike the emergency remote teaching that happens when bad weather closes schools and teachers must adapt lessons "on the fly," blended learning is designed and planned for virtual delivery at the outset.

Key Terms and Definitions

Asynchronous learning: Learners work at their own pace and on their own schedule.

Blended learning: Use of technologies or virtual components to enhance in-person learning.

Digital equity: A condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy and economy.

Digital literacy: A person's understanding of technology tools and how to use them.

Hybrid learning: A mix of in-person and virtual learning.

In-person learning: Also called face-to-face learning; facilitators and learners are in the same space at the same time.

Instructor-facilitated learning: Facilitators provide direct support to help learners discover and process knowledge and skills.

Intelligent tutoring systems: Computer-based programs or apps that provide customized instruction and feedback to help learners identify needs and master concepts or skills.

Openly licensed educational resources: Also called open educational resources, or OER, these are teaching, learning and research resources that reside in the public domain or have been released under a license that permits their free use, modification and sharing with others.

Resource-facilitated learning: Learners use assigned or self-collected resources to discover and process new content or practice skills.

Synchronous learning: Learners and facilitators work at the same time and focus on the same information.

Social presence: Term used to describe emotional attachments at play whenever teachers and students work together. Key concepts in theories of social presence include human connectedness, relationships, engagement, a sense of belonging, kindness and compassion.

Virtual learning: Also called distance, online, digital and remote learning; the use of virtual tools to connect facilitators and learners who aren't in the same physical space.

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Technology Proficiency in K-12 and Out-of-School Time

Although higher education and job-embedded learners have long had the benefits of well-designed virtual learning, many K-12 students and out-of-school time program participants historically relied on in-person learning, so engaging in emergency remote teaching and learning proved to be a struggle for them. Out-of-school time programs, which tend to serve the least-advantaged students, often saw their hours greatly reduced because of shifts in school-day schedules, and attendance was often low when they did operate (Afterschool Alliance, 2021).

To address the need for all educators to become more proficient with technology, states and districts provided much just-in-time training during the pandemic, and teacher education programs looked at increasing training for preservice teachers (Hartshorne et al. 2020).

To fill the knowledge gaps in the moment, educators and researchers explored best practices in providing information and support to teachers and families who struggled to engage and retain student interest in virtual settings. Research data, anecdotal data and educators who used technology for networking all contributed to these efforts (e.g., Barbour et al., 2020; Gallagher & Cottingham, 2020; Goodell & Kessler, 2020; IES, 2020a; IES, 2020b; National Geographic, 2020).

Equity Issues in K-12 and Out-of-School Time Learning

The emergency nature of the COVID-19 pandemic drew increased attention to existing equity barriers and caused educators and policy makers to explore solutions for addressing them.

The Digital Divide
The "digital divide" is real, large, and affects U.S. students and teachers (Chandra et al., 2020). A spring 2020 analysis by Common Sense Media and the Boston Consulting Group showed that 15 to 16 million public school students were without adequate internet access or computing devices to facilitate virtual learning. Nearly 10% of public school teachers (300,000 to 400,000) also lived in the gap, which limited their ability to deliver distance learning. A fall 2020 survey showed that 60% of American voters thought broadband internet access should be an "immediate" concern for Congress, and 76% believed internet access for students and teachers was a major problem (Internet Innovation Alliance & Morning Consult, 2020). Low-income parents identified three specific obstacles their children faced: (1) having only a cellphone to use for schoolwork, (2) needing to use public Wi-Fi for homework because they had no reliable internet service at home, and (3) having no way to complete schoolwork because they lacked a computer at home (Vogels, 2020).

The Homework Gap
The "homework gap" is a distinct part of the digital divide. Research by Common Sense Media (Fazlullah & Ong, 2019) focused on teacher perspectives and found that students without internet access and/or computers at home struggled to complete homework assignments that required online access. The students most affected were likely to be African American, Latinx, and Native American from low-income families. The teachers said they often limited their homework assignments because some students could not complete them.

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The Digital Use Divide

Early discussions of the digital divide focused on access to the internet and devices for accessing it. Since then, other levels of the digital divide have been defined, among them the digital use divide, sometimes called the "new" digital divide. It considers digital literacy and the gap between people who are consumers of digital content and people who create the content, and focuses on helping more consumers to become creators. Gender differences are one part of this divide, with girls and women being underrepresented in classes and careers that focus on creating many types of digital content (Fox, n.d.). This divide appears even in classrooms that have and use up-to-date virtual tools. As with other levels of the digital divide, schools that serve higher-income areas tend to be more intentional about technology teaching and use, taking technology integration to a deeper level than schools in low-income areas, even those that are well equipped with technology. The difference comes down to how students are taught and encouraged to use technology. When students are active rather than passive users, they learn to use virtual tools and settings to gather and evaluate information, communicate and work collaboratively, and to solve problems, conduct research or create original works (McVeigh-Murphy, 2020). Pandemic-related school closings moved educators toward supporting themselves and their students to become active users — and built momentum that can be leveraged to everyone's advantage.

The COVID Slide

The COVID slide, like the summer slide, could have long-lasting impacts on students, especially those most affected by the digital divide (Ceres, 2020). In a fall 2020 RAND American Educator Panels survey, teachers reported a majority of students as less prepared to participate in grade-level work than in past years, and reports of "significantly less prepared" came from the highest-poverty schools and schools with high percentages of minority students (Stelitano et al., 2020). The participating teachers noted that attendance, especially for students in hybrid and fully remote settings, was below average (around 85% compared to 94% in the 2015-16 school year), and secondary students were less likely to attend every day compared to elementary students. In schools without in-person instruction, teachers reported being able to contact only about 80% of their students. When asked about curriculum coverage, more than half of teachers indicated covering half or less of the content they would have covered in a normal year (Diliberti & Kaufman, 2020). Recommendations for addressing the learning loss caused by pandemic-related school closures have included providing one-on-one tutoring and intensive, high-quality summer programs (Irving, 2020).

Teacher Dissatisfaction and Shortages

Fall 2020 survey results (Diliberti & Kaufman, 2020) reflected what media stories and anecdotes were reporting — teachers needed to work more hours to provide remote teaching, teachers were experiencing burnout, and about a quarter of teachers reported being likely to leave the profession. In addition, more than half of teachers were dissatisfied with or had mixed feelings about decisions related to remote and in-person learning. Shortages of qualified substitute teachers intensified other pandemic-related pressures. Teachers also felt frustrated by a lack of guidance and support to address the special learning needs of students with disabilities, English learners, students experiencing homelessness and students affected by poverty. Recommendations for addressing these concerns included directing more resources to schools that deliver remote instruction to high-poverty and high-minority populations and making schools safer to attend in person.

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Using Virtual Technologies to Support Out-of-School Time Program Goals

While education researchers and K-12 educators search for solutions to the equity issues described above, they continue to explore potential uses and benefits of virtual learning and engagement. The following insights and strategies suggest that gaining "the virtual edge" can help out-of-school time programs achieve their goals.

Integrating Social Aspects of Learning Into Virtual Settings

During the pandemic, one important difference between in-person schooling and emergency remote teaching was the lack of physical and social structures designed to support learning experiences. When people share physical learning spaces, they share social norms and interactions. Student-teacher and student-student connections are made, formal and informal mentoring happens, and physical presence facilitates collaborating. Social supports for learning come from two communities: the student's personal community (e.g., family, friends) and the people who make up the academic community (e.g., fellow students, instructors, tutors). Research shows that the "social presence" aspect of learning can be created in virtual settings, once educators have time to learn and incorporate strategies into planning and delivering online learning (Borup et al., 2020; Gallagher & Cottingham, 2020; Hodges et al., 2020; IES, 2020a; Schultz & DeMers, 2020). To encourage student engagement and willingness to appear on camera during virtual programming, many 21st Century Community Learning Centers (21st CCLC) sites devised several strategies, such as staff and students dressing up to match a learning theme, students facilitating icebreakers, or simply opening up times for students to talk about themselves and share information. Other activities included asynchronous programming aimed at getting students outdoors to take photos or videos for special projects. Activities such as these supported social connections through collaboration and brainstorming. Many educators agreed on the value of opening their online sessions with social-emotional activities, saying that dedicating a few minutes to building community made it easy to transition to learning (U.S. Department of Education, 2021).

Strengthening Family and Community Engagement

Parents and educators are busy people, so it can be hard to make time for in-person meetings. During the pandemic, many schools found virtual Individualized Education Program (IEP) meetings to be so efficient that they decided to continue using that format. In addition, when students need to learn from home, family members become the front line of support for negotiating technology issues and managing learning time. Educators can use virtual technologies to establish communication strategies and maintain trusting relationships with families. With the latest generation of translation apps, virtual technologies can facilitate conversations and share information with family members who are not native English speakers. Making information available in family languages and in formats they can use strengthens existing connections and builds family knowledge to support student learning. Out-of-school time program leaders have devised other effective ways to use virtual technologies, including holding virtual orientation and celebration meetings, and dedicating space on their program websites to give parents information about schedules, homework support basics and netiquette — norms about online behavior expectations. Online family engagement strategies may include monthly coffee chats in multiple languages, wellness checks, and information about vaccinations and community services. Programs have also formed connections with community partners and agencies to support food

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distribution programs and to deliver packets of learning materials to students (IES, 2020c; U.S. Department of Education, 2021).

Enhancing Staff Development

In spring 2020, most K-12 educators faced a steep learning curve when schools made the sudden shift to virtual teaching. Not only did they need to teach on a virtual platform, they needed to learn how to use one while learning on one. The struggles they faced have informed, and perhaps advanced, efforts to better prepare preservice teachers to use virtual technologies (Hartshorne et al., 2020). Meanwhile, websites and social media have provided ideal platforms for many teachers to share effective strategies and information — in effect, providing peer mentoring. Some examples of these platforms are YouTube, We Are Teachers, and National Geographic's #TeacherStrong and @NatGeoEducation. Educators are now seeing the benefits that businesses have enjoyed during years of using virtual training programs. For out-of-school time programs, where a large percentage of staff members hold more than one job, managing the simple logistics of in-person professional learning has always been difficult. Once across the barriers of gaining internet access and devices for staff members, school and program leaders have come to appreciate the ability to use the flipped classroom model for their own learning. They can fit self-paced online learning into their individual schedules, then gather on a virtual platform (or in person) to process the learning with colleagues and plan how to implement what they learned. Sharing leadership of synchronous virtual sessions provides staff members with a safe environment for honing their virtual delivery skills. For 21st CCLC program staff, the U.S. Department of Education's You for Youth (Y4Y) online professional learning portal provides a wide range of learning topics and formats, and other organizations also offer some targeted, virtual learning opportunities. Anecdotal reports almost universally agree that this virtual approach makes professional learning more accessible than in the past (U.S. Department of Education, 2021).

Facilitating Program Management and Continuous Improvement

Teachers and out-of-school time practitioners welcomed their introductions to digital tools and virtual settings for handling a variety of tasks.

- Some advantages of managing with virtual technology are as obvious as providing **access to lesson plans and other important information** through secure online files.
- Likewise, experienced out-of-school time program leaders emphasize the value of using digital spreadsheets to **track budget status and inventories** of equipment and supplies. Although official information and reporting may be handled by a budget office, immediate access to current information makes day-to-day decisions easy to manage.
- Some 21st CCLC program and site leaders mentioned unexpected advantages to virtual programming, specifically in the areas of **monitoring student engagement and observing activities for fidelity of implementation**. When programs are operating in person, program leaders need to travel to every site to observe how staff and students interact and whether activities are delivered as designed. Digital tools and observations opened up more time and opportunity for these tasks. Some digital tools, like GoGuardian, enable program staff to gauge student engagement by observing students' screens. Virtual platforms that provide large- and small-group gatherings, like Google Classroom and Zoom, enable an observer to watch activities as a participant and to move among breakout

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rooms at will. Some sites have adapted existing observation instruments to virtual programming or used the Virtual Observation Guide version of the Youth Program Quality Assessment.

- Some **changes to program policies and procedures** were prompted by the move to fully virtual programming. Some were related to online behavior norms (e.g., always on camera, positivity, high energy) and some to completing professional learning assignments.

Expanding Student Opportunities and Supports

Not so long ago, educators wished for ways to give every student opportunities to engage in real-world science experiments, hold conversations with astronauts, tour college campuses and businesses, observe doctors and veterinarians at work, or visit other countries. Today, virtual technologies make these and other experiences possible for every student and classroom with access to the internet. As with any learning experience, the key is ensuring student engagement. For guidance on ways to design and deliver virtual events to achieve engagement, see these evidence-based ideas:

- **Provide staff with professional learning to support student engagement.** This should include approaches that build 21st century skills to support success in learning and in life. These skills include problem solving, communication, collaboration, critical thinking, creativity and more (Partnership for 21st Century Skills, 2019), and the approaches for teaching them help students use hands-on learning to connect with real-world experiences. Think project-based learning, citizen science and civic engagement, for example. By surveying students about their interests, programs can use student voice to select activities that appeal to students; they can then use intentional design to embed specific skills and knowledge that target student learning needs. Help staff learn to use technology to provide feedback in a variety of formats, such as using an audio recording instead of writing comments on a document or encouraging a two-way conversation with an interactive whiteboard, which can work whether the setting is virtual or in person. The whiteboard response option gives shy students a way to respond without being put on the spot, thus contributing to a positive, equitable environment (Herburger, Holdheide, & Sacco, 2020).

- **Help students develop independent learning skills by teaching and modeling strategies.** Establish a routine that breaks learning time into chunks and incorporates brain and activity breaks. When in a virtual environment, make sure the chunks are manageable and, whenever possible, offer multiple ways to access the content. Offer real-time feedback and use prompts to promote higher-level thinking (e.g., "What's another perspective that might be important?"). Introduce note-taking strategies, use rubrics to describe expectations, and encourage students to prioritize steps toward solving problems. Be explicit about the value of using such techniques for independent learning, and gradually step aside as you encourage students to facilitate group discussions and activities (Herburger, Holdheide, & Sacco, 2020).

- **Help students master virtual tools.** It's easy to imagine that young people know everything about using technology, and they may know more than most adults about using social media, music and video tools. At the same time, they may be less than literate with the tools they'll need for future jobs and academic pursuits. These include word processing programs, data management tools like spreadsheets, and presentation tools such as

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slideshows, videos and podcasts. They may also need to learn about distinguishing between factual information and opinions or misinformation, all of which will be returned in a typical web search. Start by determining what students already know, then help them learn the tools they'll need to use in your program's virtual learning experiences, including any assistive technologies. Just like teachers and staff members, students need opportunities to practice and ways to refresh knowledge with video tutorials or other materials. Family members who support them at home will also need this orientation. During instruction, model the use of technologies to help students see the range of uses. Make technology support available, and provide information about how to access it (Herburger et al., 2020).

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